CLAIMS

1.   A method of providing a network service including:

        implementing a forwarding agent on a router wherein the forwarding agent is operative to receive instructions from a service manager;

5   forwarding packets from the forwarding agent to the service manager; and

        receiving instructions at the forwarding agent from the service manager detailing how to handle the forwarded packets.

2.   A method of providing a network service as recited in claim 1 wherein the forwarding agent forwards packets to the service manager using UDP.

10 3.   A method of providing a network service including:

        receiving packet interest instructions from a service manager at a forwarding agent specifying packets that the forwarding agent is instructed to send to the service manager;

        receiving an initial packet at a forwarding agent that matches one of the
15 packets specified in the packet interest instructions from the service manager; and

        sending the initial packet from the forwarding agent to the service manager so that the packet may be processed at the service manager to determine actions that are to be performed for the packet.

4.   A method of providing a network service as recited in claim 3 further including:

        receiving packet handling instructions from the service manager at the forwarding agent that include the actions determined by the service manager for the packet.

5   5.   A method of providing a network service as recited in claim 4 wherein receiving packet handling instructions from the service manager at the forwarding agent that include the actions determined by the service manager for the packet includes receiving a UDP packet at the forwarding agent.

6.   A method of providing a network service as recited in claim 4 further including:

10   receiving the initial packet from the service manager back at the forwarding agent along with the packet handling instructions; and

        handling the packet at the forwarding agent according to the packet handling instructions.

7.   A method of providing a network service as recited in claim 6 wherein handling the packet at the forwarding agent according to the packet handling instructions includes translating the destination IP address in the packet so that the packet is forwarded to a different IP address than the IP address originally included in the packet header.

5   8.   A method of providing a network service as recited in claim 6 wherein handling the packet at the forwarding agent according to the packet handling instructions includes sending the packet to a destination specified in the packet handling instructions using tag switching.

9.   A method of providing a network service as recited in claim 6 wherein handling
10   the packet at the forwarding agent according to the packet handling instructions includes sending the packet to a destination specified in the packet handling using IP tunneling

10.   A method of providing a network service as recited in claim 4 further including:

receiving a subsequent packet at the forwarding agent;

determining that the subsequent packet matches a criteria included in the
15   packet handling instructions; and

handling the packet at the forwarding agent according to the packet handling instructions.

11.   A method of providing a network service as recited in claim 3 further including forwarding the packet from the service manager to a destination other than the forwarding agent, the destination being determined by the service manager.

12.   A method of providing a network service as recited in claim 11 wherein

5   forwarding the packet from the service manager to a destination other than the forwarding agent includes translating the destination IP address in the packet.

13.   A method of providing a network service as recited in claim 11 wherein forwarding the packet from the service manager to a destination other than the forwarding agent includes sending the packet to the destination using tag switching.

10   14.   A method of providing a network service as recited in claim 11 wherein forwarding the packet from the service manager to a destination other than the forwarding agent includes sending the packet to the destination using IP tunneling.

15.   A method of providing a network service as recited in claim 3 wherein the forwarding agent is implemented on a router.

15   16.   A method of providing a network service as recited in claim 3 wherein the forwarding agent is implemented on a switch.

17.   A method of providing a network service as recited in claim 3 wherein receiving packet interest instructions from a service manager at a forwarding agent specifying packets that the forwarding agent is instructed to send to the service manager includes

20   receiving a multicast of the packet interest instructions sent to a plurality of forwarding agents.

18. A method of providing a network service as recited in claim 17 further including receiving unicast packet handling instructions from the service manager at the forwarding agent that include the actions determined by the service manager for the packet.

19. A method of providing a network service as recited in claim 17 further including receiving multicast packet handling instructions from the service manager at the plurality of forwarding agents that include the actions determined by the service manager for the packet.

20. A method of providing a network service as recited in claim 3 further including specifying packets that the forwarding agent is instructed to send to the service manager includes receiving a UDP packet at the forwarding agent.

21. A method of providing a network service as recited in claim 3 wherein receiving packet interest instructions from a service manager at a forwarding agent includes receiving a wildcard affinity at the forwarding agent.

22. A method of providing a network service as recited in claim 21 wherein the wildcard affinity includes a source IP address, a destination IP address, a source port number, and a destination port number.

23. A method of providing a network service as recited in claim 22 wherein the wildcard affinity further includes a protocol identifier.

24. A method of providing a network service as recited in claim 22 wherein the wildcard affinity source IP address includes a plurality of IP addresses.

25. A method of providing a network service as recited in claim 22 wherein the wildcard affinity destination IP address includes a plurality of IP addresses.

26.   A method of providing a network service as recited in claim 22 wherein the wildcard affinity destination port includes a plurality of ports.

27.   A method of providing a network service as recited in claim 22 wherein the wildcard affinity source port includes a plurality of ports.

5   28.   A method of providing a network service as recited in claim 22 wherein the wildcard affinity source IP address includes a range of IP addresses.

29.   A method of providing a network service as recited in claim 22 wherein the wildcard affinity destination IP address includes a range of IP addresses.

30.   A method of providing a network service as recited in claim 22 wherein the
10   wildcard affinity destination port includes a range of ports.

31.   A method of providing a network service as recited in claim 22 wherein the wildcard affinity source port includes a range of ports.

32.   A method of providing a network service as recited in claim 22 wherein the wildcard affinity source IP address specifies a set of IP addresses by using a mask.

15   33.   A method of providing a network service as recited in claim 22 wherein the wildcard affinity destination IP address specifies a set of IP addresses by using a mask.

34.   A method of providing a network service as recited in claim 3 wherein the action determined is translating the destination IP address of the initial packet.

35. A method of providing a network service as recited in claim 3 wherein the action determined is forwarding the initial packet to a destination different than the destination IP address of the initial packet.

36. A method of providing a network service as recited in claim 3 wherein the action determined is forwarding the initial packet without changing the initial packet and reporting information about the packet to the service manager.

37. A method of providing a network service as recited in claim 3 wherein the action determined is translating the source IP address of the initial packet.

38. A forwarding agent comprising:

a service manager receiving interface for receiving instructions from a service manager specifying actions to be performed for server designated packets ;

a service manager sending interface for sending packets to the service manager;

a network packet receiving interface for receiving IP packets from a network;

a network packet forwarding interface for forwarding IP packets to the network;

a processor for performing the specified actions on the server designated packets.

39.   A forwarding agent as recited in claim 38 further including a service manager instruction storage for storing the service manager instructions.

40.   A forwarding agent as recited in claim 39 wherein the service manager instruction storage includes a general instruction storage that stores criteria for forwarding packets to the service manager and a specific instruction storage that stores specific instructions for handling server designated packets.

41.   A forwarding agent as recited in claim 39 further including a comparator for comparing portions of newly received packets to the stored criteria.

42.   A forwarding agent as recited in claim 39 wherein the stored criteria are affinities.

43.   A forwarding agent as recited in claim 38 wherein the stored criteria are affinities.

44.   A forwarding agent as recited in claim 38 wherein the stored criteria are source IP address, destination IP address, source port and destination port.

45.   A forwarding agent as recited in claim 38 wherein the server designated packets are designated by affinities.

46.   A forwarding agent as recited in claim 38 wherein the server designated packets are designated by source IP address, destination IP address, source port and destination port.

47.   A forwarding agent as recited in claim 38 wherein the service manager receiving interface and the network packet receiving interface are the same interface.

48.   A computer program product for handling packets, the computer program product being embodied in a computer readable medium and comprising computer instructions for:

implementing a forwarding agent on a router wherein the forwarding agent is operative to receive instructions from a service manager;

forwarding packets from the forwarding agent to the service manager; and

receiving instructions at the forwarding agent from the service manager detailing how to handle the forwarded packets.

49.   A computer program product for providing a network service, the computer program product being embodied in a computer readable medium and comprising computer instructions for:

receiving packet interest instructions from a service manager at a forwarding agent specifying packets that the forwarding agent is instructed to send to the service manager;

receiving an initial packet at a forwarding agent that matches one of the packets specified in the packet interest instructions from the service manager; and

sending the initial packet from the forwarding agent to the service manager so that the packet may be processed at the service manager to determine actions that are to be performed for the packet.

50.   A computer program product for providing a network service as recited in claim 49, the computer program product further comprising computer instructions for:

receiving packet handling instructions from the service manager at the forwarding agent that include the actions determined by the service manager for the packet.

51.   A computer program product for providing a network service as recited in claim 50 wherein receiving packet handling instructions from the service manager at the forwarding agent that include the actions determined by the service manager for the packet includes receiving a UDP packet at the forwarding agent.

52.   A computer program product for providing a network service as recited in claim 50, the computer program product further comprising computer instructions for:

receiving the initial packet from the service manager back at the forwarding agent along with the packet handling instructions; and

handling the packet at the forwarding agent according to the packet handling instructions.

53.   A computer program product for providing a network service as recited in claim 52 wherein handling the packet at the forwarding agent according to the packet handling instructions includes translating the destination IP address in the packet so that the packet is forwarded to a different IP address than the IP address originally included in the packet header.

54.   A computer program product for providing a network service as recited in claim 52 wherein handling the packet at the forwarding agent according to the packet handling instructions includes sending the packet to a destination specified in the packet handling instructions using tag switching.

55.   A computer program product for providing a network service as recited in claim 52 wherein handling the packet at the forwarding agent according to the packet handling instructions includes sending the packet to a destination specified in the packet handling using IP tunneling

56.   A computer program product for providing a network service as recited in claim 50, the computer program product further comprising computer instructions for:

        receiving a subsequent packet at the forwarding agent;

        determining that the subsequent packet matches a criteria included in the packet handling instructions; and

        handling the packet at the forwarding agent according to the packet handling instructions.

57.   A computer program product for providing a network service as recited in claim 49, the computer program product further comprising computer instructions for forwarding the packet from the service manager to a destination other than the forwarding agent, the destination being determined by the service manager.

5   58.   A computer program product for providing a network service as recited in claim 57 wherein forwarding the packet from the service manager to a destination other than the forwarding agent includes translating the destination IP address in the packet.

59.   A computer program product for providing a network service as recited in claim 57 wherein forwarding the packet from the service manager to a destination other than 10   the forwarding agent includes sending the packet to the destination using tag switching.

60.   A computer program product for providing a network service as recited in claim 57 wherein forwarding the packet from the service manager to a destination other than the forwarding agent includes sending the packet to the destination using IP tunneling.

61.   A computer program product for providing a network service as recited in claim 15   49 wherein the forwarding agent is implemented on a router.

62.   A computer program product for providing a network service as recited in claim 49 wherein the forwarding agent is implemented on a switch.

63.   A computer program product for providing a network service as recited in claim 49 wherein receiving packet interest instructions from a service manager at a forwarding 20   agent specifying packets that the forwarding agent is instructed to send to the service manager includes receiving a multicast of the packet interest instructions sent to a plurality of forwarding agents.

64.   A computer program product for providing a network service as recited in claim 63, the computer program product further comprising computer instructions for receiving unicast packet handling instructions from the service manager at the forwarding agent that include the actions determined by the service manager for the packet.

5   65.   A computer program product for providing a network service as recited in claim 63, the computer program product further comprising receiving multicast packet handling instructions from the service manager at the plurality of forwarding agents that include the actions determined by the service manager for the packet.

        66.   A computer program product for providing a network service as recited in claim
10   49, the computer program product further comprising computer instructions for specifying packets that the forwarding agent is instructed to send to the service manager includes receiving a UDP packet at the forwarding agent.

        67.   A computer program product for providing a network service as recited in claim 49 wherein receiving packet interest instructions from a service manager at a forwarding
15   agent includes receiving a wildcard affinity at the forwarding agent.

        68.   A computer program product for providing a network service as recited in claim 67 wherein the wildcard affinity includes a source IP address, a destination IP address, a source port number, and a destination port number.

        69.   A computer program product for providing a network service as recited in claim
20   68 wherein the wildcard affinity further includes a protocol identifier.

        70.   A computer program product for providing a network service as recited in claim 68 wherein the wildcard affinity source IP address includes a plurality of IP addresses.

71.   A computer program product for providing a network service as recited in claim 68 wherein the wildcard affinity destination IP address includes a plurality of IP addresses.

72.   A computer program product for providing a network service as recited in claim 68 wherein the wildcard affinity destination port includes a plurality of ports.

73.   A computer program product for providing a network service as recited in claim 68 wherein the wildcard affinity source port includes a plurality of ports.

74.   A computer program product for providing a network service as recited in claim 68 wherein the wildcard affinity source IP address includes a range of IP addresses.

75.   A computer program product for providing a network service as recited in claim 68 wherein the wildcard affinity destination IP address includes a range of IP addresses.

76.   A computer program product for providing a network service as recited in claim 68 wherein the wildcard affinity destination port includes a range of ports.

77.   A computer program product for providing a network service as recited in claim 68 wherein the wildcard affinity source port includes a range of ports.

78.   A computer program product for providing a network service as recited in claim 68 wherein the wildcard affinity source IP address specifies a set of IP addresses by using a mask.

79.   A computer program product for providing a network service as recited in claim 68 wherein the wildcard affinity destination IP address specifies a set of IP addresses by using a mask.

80.   A computer program product for providing a network service as recited in claim 49 wherein the action determined is translating the destination IP address of the initial packet.

81.   A computer program product for providing a network service as recited in claim
5   49 wherein the action determined is forwarding the initial packet to a destination different than the destination IP address of the initial packet.

82.   A computer program product for providing a network service as recited in claim 49 wherein the action determined is forwarding the initial packet without changing the initial packet and reporting information about the packet to the service manager.

10   83.   A computer program product for providing a network service as recited in claim 49 wherein the action determined is translating the source IP address of the initial packet.

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